



**ALASKA POLLUTANT DISCHARGE ELIMINATION SYSTEM
PERMIT FACT SHEET –DRAFT**

Permit Number: AK0053384

Ward Cove Wastewater Treatment Plant

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

Wastewater Discharge Authorization Program

555 Cordova Street

Anchorage, AK 99501

Public Comment Period Start Date: July 28, 2014

Public Comment Period Expiration Date: August 28, 2014

[Alaska Online Public Notice System](#)

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Proposed issuance of an Alaska Pollutant Discharge Elimination System (APDES) permit to

FULL CYCLE LLC

For wastewater discharges from

Ward Cove Wastewater Treatment Plant
7559 North Tongass Highway
Ketchikan, AK, 99901

The Alaska Department of Environmental Conservation (the Department or DEC) proposes to reissue an APDES individual permit (permit) to Full Cycle LLC. The permit authorizes and sets conditions on the discharge of pollutants from this facility to waters of the United States. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can

be discharged from the facility and outlines best management practices to which the facility must adhere.

This fact sheet explains the nature of potential discharges from the Ward Cove Wastewater Treatment Plant and the development of the permit including:

- information on public comment, public hearing, and appeal procedures
- a listing of proposed effluent limits and other conditions
- technical material supporting the conditions in the permit
- proposed monitoring requirements in the permit

Public Comment

Persons wishing to comment on, or request a public hearing for the draft permit for this facility, may do so in writing by the expiration date of the public comment period.

Commenters are requested to submit a concise statement on the permit condition(s) and the relevant facts upon which the comments are based. Commenters are encouraged to cite specific permit requirements or conditions in their submittals.

A request for a public hearing must state the nature of the issues to be raised, as well as the requester's name, address, and telephone number. The Department will hold a public hearing whenever the Department finds, on the basis of requests, a significant degree of public interest in a draft permit. The Department may also hold a public hearing if a hearing might clarify one or more issues involved in a permit decision or for other good reason, in the Department's discretion. A public hearing will be held at the closest practicable location to the site of the operation. If the Department holds a public hearing, the Director will appoint a designee to preside at the hearing. The public may also submit written testimony in lieu of or in addition to providing oral testimony at the hearing. A hearing will be tape recorded. If there is sufficient public interest in a hearing, the comment period will be extended to allow time to public notice the hearing. Details about the time and location of the hearing will be provided in a separate notice.

All comments and requests for public hearings must be in writing and should be submitted to the Department at the technical contact address, fax, or email identified above (see also the public comments section of the attached public notice). Mailed comments and requests must be postmarked on or before the expiration date of the public comment period.

After the close of the public comment period and after a public hearing, if applicable, the Department will review the comments received on the draft permit. The Department will respond to the comments received in a Response to Comments document that will be made available to the public. If no substantive comments are received, the tentative conditions in the draft permit will become the proposed final permit.

The proposed final permit will be made publicly available for a five-day applicant review. The applicant may waive this review period. After the close of the proposed final permit review period, the Department will make a final decision regarding permit issuance. A final permit will become effective 30 days after the Department's decision, in accordance with the state's appeals process at 18 AAC 15.185.

The Department will transmit the final permit, fact sheet (amended as appropriate), and the Response to Comments to anyone who provided comments during the public comment period or who requested to be notified of the Department's final decision.

The Department has both an informal review process and a formal administrative appeal process for final APDES permit decisions. An informal review request must be delivered within 15 days after receiving the Department's decision to the Director of the Division of Water at the following address:

Director, Division of Water
Alaska Department of Environmental Conservation
410 Willoughby Street, Suite 303
Juneau AK, 99811-1800

Interested persons can review 18 AAC 15.185 for the procedures and substantive requirements regarding a request for an informal Department review.

See <http://www.dec.state.ak.us/commish/InformalReviews.htm> for information regarding informal reviews of Department decisions.

An adjudicatory hearing request must be delivered to the Commissioner of the Department within 30 days of the permit decision or a decision issued under the informal review process. An adjudicatory hearing will be conducted by an administrative law judge in the Office of Administrative Hearings within the Department of Administration. A written request for an adjudicatory hearing shall be delivered to the Commissioner at the following address:

Commissioner
Alaska Department of Environmental Conservation at
410 Willoughby Street, Suite 303
Juneau AK, 99811-1800.

Interested persons can review 18 AAC 15.200 for the procedures and substantive requirements regarding a request for an adjudicatory hearing. See <http://www.dec.state.ak.us/commish/ReviewGuidance.htm> for information regarding appeals of Department decisions.

Documents are Available

The permit, fact sheet, application, and related documents can be obtained by visiting or contacting DEC between 8:00 a.m. and 4:30 p.m. Monday through Friday at the addresses below. The permit, fact sheet, application, and other information are located on the Department's Wastewater Discharge Authorization Program website: <http://www.dec.state.ak.us/water/wwdp/index.htm>.

Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program 555 Cordova Street Anchorage, AK 99501 (907) 269-6285	Alaska Department of Environmental Conservation Division of Water Wastewater Discharge Authorization Program 410 Willoughby Avenue, Suite 310 Juneau, AK 99801 (907) 465-5180
Alaska Department of Environmental Conservation 540 Water Street, Suite 203 Ketchikan, AK 99901 (907) 225-6200	

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1.0 APPLICANT

This fact sheet provides information on the preliminary draft Alaska Pollutant Discharge Elimination System (APDES) permit for the following entity:

Name of Facility:	Ward Cove Wastewater Treatment Plant (WWTP)
APDES Permit Number:	AK0053384
Facility Location:	Ketchikan, Alaska
Mailing Address:	7559 North Tongass Highway, Ketchikan, AK 99901
Facility Contact:	Mr. David Spokely

The map in Appendix A to the Fact Sheet shows the location of the treatment plant and the discharge location.

2.0 FACILITY INFORMATION

The Ward Cove WWTP is located in Ketchikan and was designed and constructed to provide secondary treatment for up to 25,000 gallons per day (GPD) of domestic wastewater using activated sludge and extended aeration prior to final discharge into the marine waters of Ward Cove. Sources of domestic wastewater treated at the Ward Cove WWTP include domestic waste generated onsite by up to approximately 125 people, equating to approximately 4,500 GPD. Additional domestic wastewater sources include up to 10,000 GPD of wastewater/filtrate generated by a sludge composting facility, including wastewater from dewatering and wash-down operations at the composting facility, septage from septic tanks located throughout the Ketchikan Gateway Borough and septage from marine vessels. The sludge composting wastewater is discharged from a holding tank into the WWTP. The WWTP does not treat storm water or wastewater from industrial sources.

The domestic wastewater generated onsite is transported to the Ward Cove WWTP via an underground separate sanitary sewer pipeline collection system. The sludge press/compost facility is located near the WWTP. Dewatered solids are containerized and shipped to a disposal facility and the filtrate/wastewater is sent to a holding tank that discharges to the WWTP at a maximum rate of 10,000 GPD.

A diagram of the treatment process is included in Figure 2 of Appendix A. Treatment is achieved via screening, aeration, settling and chlorination. Treatment begins at the facility when the influent is screened through a bar screen and comminutor located at the influent port of the aeration tank. The bar screen removes large solids (larger than 1-inch) from the incoming raw sewage and the comminutor is a mechanical grinder/cutter designed to cut or shred large solids to less than one quarter of an inch to promote digestion by the bacteria in the aeration tank.

After screening, the wastewater passes into the aeration tank, where aerobic bacteria and other organisms breakdown the waste. These microorganisms form a dark brown mass called activated sludge that is mixed with the incoming wastewater. Mixing is achieved by introducing air along one side of the tank through the bottom diffusers, thereby setting up mixing currents within the liquid and maintaining an air supply to allow the organisms to decompose the sewage into carbon dioxide and water and other breakdown products. A rotary blower housed in a metal structure mounted atop the settling tank provides the air, which is piped through air header pipes to the diffusers at the bottom of the aeration tank. A second blower is available as a backup. Each blower is equipped with a fifteen minute interval timer to control the amount of air supplied. The aeration tank is designed to provide at least 24-hours

detention time for the full design flow (25,000 GPD) and includes baffles to promote circular flow, thus avoiding dead spots and preventing accumulation of sewage solids.

From the aeration tank, the treated wastewater mixes with activated sludge and passes through a port in the wall into the settling tank, or clarifier. The clarifier has sloped walls at the bottom of the tank, similar to two inverted pyramidal hoppers. In the clarifier, the activated sludge settles to the bottom and treated wastewater flows over a weir into the discharge line. Flow rates in this tank are designed to retain the wastewater for a four hour period.

The settled sludge or bacteria at the bottom of the hoppers is then returned continuously to the aeration tank by the air lift sludge return system to decompose more incoming wastewater. The returned sludge is fermented using the influent wastewater as the carbon source to promote biological phosphorus removal and the fermentation provides extended aeration, which is designed to provide nitrification as well as removal of five-day biochemical oxygen demand (BOD₅). The aeration basin enhances settle-ability of the mixed liquor passed to the clarifier, which provides detention time to settle out sludge. In addition, an air lift type skimmer is installed in the settling tank so that floating solids can be removed and discharged back into the aeration tank.

Wastewater is disinfected using up to 69% chlorine tablets added to the effluent prior to discharge in the solution tank. The chlorinated solution is pumped into the 750 gallon contact tank. There are baffles in the contact tank to mix the wastewater with the chlorine solution for 30 to 45 minutes before effluent is transmitted from the tank.

After disinfection, effluent is discharged into a wooden stave pipeline. The wooden stave pipeline contains freshwater diverted from nearby Lake Connell. The purpose of diverting Lake Connell through the pipeline is to prevent deterioration of the wooden stave pipeline, which was used to convey water to run a steam driven turbine to generate electricity when the WWTP served a sawmill. As such, an internal outfall, 001A, is maintained to sample the treated domestic wastewater to determine compliance with secondary treatment requirements (40 CFR 133, adopted by reference in 18 AAC 83.010(e)) prior to any mixing or dilution with Lake Connell freshwater. The wood stave pipeline carrying the commingled treated effluent and Lake Connell freshwater extends 100 feet from the shoreline, as measured at mean lower low water. The end of pipe outfall was referred to as Outfall 001 in the previous permit. The Department is now referring to the end of pipe outfall as Outfall 001B, to achieve consistency between Department and Environmental Protection Agency (EPA) databases as well as the facility's Discharge Monitoring Reports. No mixing zone is authorized for the discharge as the mixing of the treated effluent and Lake Connell freshwater contained in the wood stave pipeline is sufficient for all water quality criteria to be met prior to discharge.

2.1 Background

The facility was originally constructed to treat the domestic wastewater generated at the Ketchikan Pulp Company (KPC) pulp mill. In 1997, KPC shut down the pulp mill and the facility was sold to Gateway Forest Products (GFP) in 1999. The domestic wastewater discharge from the facility was previously authorized under EPA National Pollutant Discharge Elimination System (NPDES) Permit AK000092, which was issued to GFP on December 15, 1998. Permit AK000092 also historically authorized storm water discharges and treated landfill leachate from the KPC Ward Cove Landfill. The storm water and landfill

leachate discharges, which are still the responsibility of KPC, are now authorized under a separate APDES permit (AK0053392) that was recently reissued by DEC.

In 2002, the facility was sold by GFP to the Ketchikan Gateway Borough and the domestic discharge was authorized under EPA-issued NPDES permit AK0053384, which was issued on August 24, 2004. On October 31, 2008 authority to administer the NPDES Program for domestic discharges in Alaska transferred to DEC. The 2004 permit expired on September 30, 2009, and was administratively extended by the Department as a complete application for permit reissuance was received on April 8, 2009. The facility was again sold to Power Systems and Supplies Alaska LLC on March 21, 2012. On October 23, 2013, the Department received an updated, technically complete APDES permit application that indicated that the name of the company that serves as the responsible party is now Full Cycle LLC.

3.0 COMPLIANCE HISTORY

Discharge Monitoring Reports (DMRs) submitted to the Department by previous permittees and the current permittee during the time period April 2004 to April 2014 were reviewed to determine the facility's compliance with effluent limits. The DMR review revealed that effluent monitoring and reporting were consistently not conducted properly during the subject time period. As a result of the DMR review, on December 16, 2013, DEC's Compliance and Enforcement Program issued a Notice of Violation (NOV) to the permittee. The NOV alleged that a June 13, 2013 inspection of the facility revealed that copies of the Best Management Practices (BMP) Plan and Quality Assurance Project Plan (QAPP) were not available onsite as required. The permittee submitted Department-approved copies of the QAPP and BMP Plans in May and April of 2014, respectfully. The NOV also addressed the lack of compliance with effluent limits and the reporting problems.

On January 22, 2014, the permittee provided a response to DEC's Compliance and Enforcement Program as required in the NOV. The response indicated that the permittee intended to sample effluent more frequently to aid achieving compliance with effluent limits expressed in terms of an average of sample results. The NOV response also acknowledged DMR reporting errors such as missing and miscalculated information. As such, the permittee attached 18 months of revised DMRs to the NOV response.

The permittee offered that some exceedances of permit limits were a result of operational issues. Specifically, the permittee has discontinued the practice of introducing the sludge press effluent to the WWTP on a batch basis in favor of a more continuous discharge rate, to avoid flushing the plant of bacteria and otherwise causing upset conditions. The permittee also explained that the July 2013 fecal coliform bacteria permit limit violation of 17,700 fc/100 mL was the result of maintenance operations and have now instituted a procedure to reduce the chances of this reoccurring in the future. The permittee stated in the NOV response that they may increase the amount of chlorine they use to improve the efficiency of their disinfection process. (Note, any changes to the facility's treatment system will be subject to DEC engineering plan review and approval requirements in 18 AAC 72 as well as the effluent limitations imposed in their APDES permit.) The rest of the violations attached to the NOV occurred prior to the permittee owning the facility. Table 1 summarizes treatment performance via effluent monitoring data from the facility since Full Cycle LLC assumed ownership.

Table 1: Range of Reported Influent & Effluent Monitoring Values, July 2012-April 2014

Parameter	Units	Internal Outfall 001A		End of Pipe Outfall 001B	
		Range	Permit Limit ^a	Range	Permit Limit ^a
Maximum Daily Flow	Million Gallons per Day (MGD)	0.0077 - 0.025	0.025	2.134 - 2.307	2.5
Fecal Coliform (FC) Bacteria	FC/100 mL	<10 - 40,000	800	<10 - 300	43
5 Day Biochemical Oxygen Demand (BOD ₅)	Milligrams per Liter (mg/L)	2 - 26	60	2 - 6	60
Total Suspended Solids (TSS)	mg/L	10 - 79	60	Not Applicable (N/A)	N/A
pH	Standard Units (SU)	6 – 8.8	6-9 ^b	6.6 - 7.2	6.5-8.5 ^b
Dissolved Oxygen (DO)	mg/L	3.2 - 9.8	2 ^c	9.6 - 12.4	5-17 ^b
Total Residual Chlorine (TRC)	mg/L	0.21 - 0.69	1.0	0 - 0.004	0.0075
BOD ₅ Percent Removal	%	79 - 99	85 ^c	N/A	N/A
TSS Percent Removal	%	77 - 99.7	85 ^c	N/A	N/A
BOD ₅ Influent	mg/L	N/A	N/A	N/A	39 – 448 ^d
TSS Influent	mg/L	N/A	N/A	N/A	91 – 3,370 ^d
a. Daily maximum permit limit unless otherwise noted. b. Numbers represent a range of values, expressed as “Minimum-Maximum”. c. Minimum value allowed. d. Influent concentration is monitored and reported only; no limit exists.					

4.0 EFFLUENT LIMITS AND MONITORING REQUIREMENTS

4.1 Basis for Permit Effluent Limits

The CWA requires that the limits for a particular pollutant be the more stringent of either technology-based effluent limits (TBELs) or water quality-based effluent limits (WQBELs). A TBEL is set according to the level of treatment that is achievable using available technology. A WQBEL is designed to ensure that the Alaska Water Quality Standards (WQS) are met in the receiving water body. WQBELs may be more stringent than TBELs. There are both TBELs and WQBELs in the permit. A more extensive discussion providing the basis for the proposed effluent limits in the permit is provided in Appendix B.

4.2 Basis for Effluent and Receiving Water Monitoring

In accordance with Alaska Statute (AS) 46.03.110(d), the Department may specify in a permit the terms and conditions under which waste material may be disposed. Monitoring in a permit is required to determine compliance with effluent limits. Monitoring may also be required to gather effluent data to determine if additional effluent limits are required, or to complete special studies (e.g., receiving water studies, mixing zone studies, etc.).

4.3 Effluent Limits and Monitoring Requirements

4.3.1 End of Pipe Outfall 001B

The permit contains WQBELs and monitoring requirements at the end of pipe Outfall 001B. The following summarizes the proposed effluent limits (see Appendix B for more details) and monitoring requirements. Limits and monitoring requirements for minimum flow, pH, total residual chlorine and fecal coliform bacteria have been retained from the previous permit. The monitoring frequency for most parameters was increased from twice per year to quarterly due to permit limit exceedances that occurred during the previous permit cycle. The dissolved oxygen limit was updated to conform to the most stringent WQS numeric criteria. Monitoring requirements for BOD₅ are removed from the permit.

Table 2: End of Pipe Outfall 001B Effluent Limits and Monitoring Requirements

Parameter	Effluent Limits				Monitoring Requirements		
	Daily Minimum	Monthly Average	Daily Maximum	Units	Sample Location	Sample Frequency	Sample Type
Total Discharge Flow	2.025	N/A	Report	MGD	Effluent	Continuous	Metered
Fecal Coliform Bacteria	N/A	14 ^{a, b}	43 ^a	FC/100 mL	Effluent	1/Quarter ^c	Grab
DO	6	N/A	17	mg/L	Effluent	1/Quarter	Grab
Total Residual Chlorine	N/A	N/A	0.0075 ^d	mg/L	Effluent	1/Quarter	Grab
pH	6.5	N/A	8.5	SU	Effluent	1/Quarter	Grab

Notes:

- In a 30-day period, the geometric mean may not exceed 14 FC/100 mL and not more than 10 percent of samples may exceed 43 FC/100 mL.
- All effluent fecal coliform bacteria average results must be reported as the geometric mean. When calculating the geometric mean, replace all results of zero, 0, with a one, 1. The geometric mean of “n” quantities is the “nth” root of the product of the quantities. For example the geometric mean of 100, 200, and 300 is $(100 \times 200 \times 300)^{1/3} = 181.7$.
- Once per quarter means once every three months based on the calendar year beginning with January.
- DEC has not verified that compliance with the effluent limit for total residual chlorine can be determined using EPA-approved analytical methods. DEC will use the minimum detection limit of the EPA-approved analytical method used or 0.1 mg/L, whichever is lower, as the compliance limit for this parameter.

4.3.2 Internal Outfall 001A

The permit contains limits and monitoring requirements at the internal Outfall 001A that are a combination of TBELs and WQBELs. Limits and monitoring requirements for flow, fecal coliform bacteria, BOD₅, TSS, and pH have been retained from the previous permit. New monitoring requirements have been included for enterococci bacteria on a seasonal basis and total recoverable copper on a quarterly basis.

Table 3: Internal Outfall 001A Influent and Effluent Limits and Monitoring Requirements

Parameter	Effluent Limits					Monitoring Requirements		
	Daily Minimum	Monthly Average	Weekly Average	Daily Maximum	Units	Sample Location	Sample Frequency	Sample Type
Total Discharge Flow	N/A	0.025	N/A	Report	MGD	Effluent	Continuous	Metered
BOD ₅	N/A	30	45	60	mg/L	Effluent	1/Month	24-hour Composite ^b
	N/A	6.3 ^a	9.4 ^a	12.6 ^a	lbs/day			
	N/A	Report	N/A	N/A	mg/L	Influent		
BOD ₅ Percent Removal	N/A	85	N/A	N/A	Percent (%)	Influent & Effluent	1/Month	Calculated ^c
TSS	N/A	30	45	60	mg/L	Effluent	1/Month	24-hour Composite ^b
	N/A	6.3 ^a	9.4 ^a	12.6 ^a	lbs/day			
	N/A	Report	N/A	N/A	mg/L	Influent		
TSS Percent Removal	N/A	85	N/A	N/A	%	Influent & Effluent	1/Month	Calculated ^c
Fecal Coliform Bacteria	N/A	200 ^d	400 ^d	800	FC/100 mL	Effluent	1/Month ^e	Grab
pH	6.0	N/A	N/A	9.0	SU	Effluent	3/Week	Grab
DO	2.0	N/A	N/A	N/A	mg/L	Effluent	1/Month	Grab
Total Residual Chlorine	N/A	0.5	0.75	1.0	mg/L	Effluent	3/Week	Grab
	N/A	0.1 ^a	0.16 ^a	0.21 ^a	lbs/day			
Enterococci Bacteria	N/A	N/A	N/A	Report	Count/100 mL	Effluent	1/Month ^{e,f}	Grab
Total Recoverable Copper	N/A	N/A	N/A	Report	Micrograms per Liter (µg/L)	Effluent	1/Quarter ^g	24-hour Composite ^b
<p>a. The loading limits are calculated for each facility by the following formula: pounds per day limitation = concentration limit (mg/L) x facility design flow (MGD) x 8.34 (conversion factor). Loading limitations are applicable to the average monthly, average weekly, and maximum daily basis for BOD₅, TSS and total residual chlorine.</p> <p>b. Composite samples must consist of at least eight grab samples collected at equally spaced intervals and proportionate to flow so that composite samples reflect influent/effluent quality during the compositing period.</p> <p>c. Minimum percent removal = [(average monthly influent concentration in mg/L – average monthly effluent concentration in mg/L) / (average monthly influent concentration in mg/L)] x 100. Calculation required monthly.</p> <p>d. All effluent fecal coliform and enterococci sampling average results must be reported as a geometric mean. When calculating the geometric mean, replace all results of zero, 0, with a one, 1. The geometric mean of “n” quantities is the “nth” root of the product of the quantities. For example the geometric mean of 100, 200, and 300 is $(100 \times 200 \times 300)^{1/3} = 181.7$.</p> <p>e. Enterococci bacteria and fecal coliform bacteria monitoring must occur on the same day.</p> <p>f. Monitoring required during the months of May-September only.</p> <p>g. Once per quarter means once every three months based on the calendar year beginning with January.</p>								

4.4 Influent and Effluent Monitoring

The permit requires monitoring of the effluent for BOD₅, TSS, dissolved oxygen, pH, fecal coliform, and total residual chlorine to determine compliance with the effluent limits. The permit also requires monitoring of the influent for BOD₅ and TSS to calculate monthly removal rates for

these parameters. These monitoring requirements are being carried forward from the previous permit. Some monitoring frequencies were adjusted at the end of pipe Outfall 001B to monitor the effluent more frequently and have been determined acceptable frequencies to evaluate effluent quality and variability.

New monitoring requirements have been included at the internal Outfall 001A for enterococci bacteria and total recoverable copper. Enterococci monitoring was added pursuant to the Beaches Environmental Assessment and Coastal Health (BEACH) Act (See Appendix B, Section 2.3.6 for additional information). Total recoverable copper monitoring is being required as a result of metals monitoring that occurred in August of 2013. The previous permit required metals monitoring "...only one time in the permit life cycle at end of pipe Outfall 001B to provide assurance that these constituents (toxic metals) are not present at significant levels in the discharge." The effluent metals monitoring results showed elevated levels of copper (17 µg/L at the internal Outfall 001A and 14 µg/L at the end of pipe Outfall 001B). Copper numeric water quality criteria for the protection of aquatic life in marine water are 4.8 µg/L for acute effects and 3.1 µg/L for chronic effects). Consistent with Department policy, the Department is requiring additional copper monitoring during this permit cycle to evaluate the isolated data point and establish a robust dataset to perform a future reasonable potential analysis to determine if the discharge causes or contributes to an exceedance of the copper criteria in the receiving water body. Appendix B Section 2.2 contains additional information on the metals monitoring results and the copper monitoring requirement.

The end of pipe Outfall 001B BOD₅ monitoring requirement included in the previous permit is removed in this permit issuance. The previous permit's fact sheet explained that the purpose of the BOD₅ monitoring was to "...enable an understanding of BOD₅ loading attributable to water diverted from Lake Connell." This understanding was deemed necessary at that time because in 1994 a BOD₅ Total Maximum Daily Load (TMDL) had been developed for Ward Cove. The BOD₅ TMDL was superseded in 2007 by a DO TMDL. There is no corresponding water quality criteria for BOD₅, which means there is no mechanism to calculate a WQBEL for BOD₅. Accordingly, based on the new information and consistent with 18 AAC 83.135(b)(2), there is no longer a need to continue monitoring BOD₅ at the end of the pipe. Compliance with BOD₅ permit limits is best assessed at the internal Outfall 001A where the treatment that occurs in the WWTP can be measured prior to mixing with the freshwater from Lake Connell in the wood stave pipe.

Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance. The permittee has the option of taking more frequent samples than required under the permit. These additional samples can be used for averaging if they are conducted using the Department – approved test methods (generally found in 18 AAC 70 and 40 CFR Part 136 [adopted by reference in 18 AAC 83.010]), and if the Method Detection Limits (MDLs) are less than the effluent limits.

4.5 Whole Effluent Toxicity Monitoring

18 AAC 83.435 requires that a permit contain limitations on whole effluent toxicity (WET) when a discharge has reasonable potential to cause or contribute to an exceedance of a WQS. WET tests use small vertebrate and invertebrate species and/or plants to measure the aggregate toxicity of an effluent. Because the discharge from the Ward Cove WWTP is expected to meet water quality criteria at the end of pipe Outfall 001B, the Department has determined that compliance

with the terms and conditions of the permit will ensure that reasonable potential for WET does not exist. Accordingly, WET testing is not required at this time. However, the Department has established permit requirements for other specific “indicator” pollutants (e.g., total residual chlorine and copper) to evaluate pollutants of concern associated with the wastestream that have the highest likelihood of imparting toxicity.

5.0 RECEIVING WATER BODY

5.1 Ocean Discharge Criteria

Section 403(a) of the CWA, Ocean Discharge Criteria, prohibits the issuance of a permit under Section 402 of the CWA for a discharge into the territorial sea, the water of the contiguous zone, or the oceans except in compliance with Section 403. Permits for discharges seaward of the baseline of the territorial seas must comply with the requirements of Section 403, which include development of an Ocean Discharge Criteria Evaluation (ODCE).

An interactive map depicting Alaska’s baseline plus additional boundary lines is available at <http://www.charts.noaa.gov/OnLineViewer/AlaskaViewerTable.shtml>. The map is provided for information purposes only. The U.S. Baseline committee makes the official determinations on baseline.

A review of the baseline line maps revealed that the baseline extends across the mouth of Ward Cove. The Ward Cove WWTP end of pipe Outfall 001B is positioned landward of the baseline of the territorial sea; therefore, Section 403 of the CWA does not apply to the permit, and an ODCE is not required to be completed for this permit reissuance.

5.2 Water Quality Standards

Regulations in 18 AAC 70 require that the conditions in permits ensure compliance with the WQS. The State’s WQS are composed of use classifications, numeric and/or narrative water quality criteria, and an antidegradation policy. The use classification system designates the beneficial uses that each water body is expected to achieve. The numeric and/or narrative water quality criteria are the criteria deemed necessary by the state to support the beneficial use classification of each water body. The antidegradation policy ensures that the beneficial uses and existing water quality are maintained.

Water bodies in Alaska are designated for all uses unless the water has been reclassified under 18 AAC 70.230, as listed under 18 AAC 70.230(e). Some water bodies in Alaska can also have site-specific water quality criterion per 18 AAC 70.235, such as those listed under 18 AAC 70.236(b).

Ward Cove has not been reclassified, nor have site-specific water quality criteria been established and therefore is designated for all uses. Use classes (2) (A, B, C, and D) are protected in accordance with 18 AAC 70.050. These use classes include (A) water supply (aquaculture, seafood processing, and industrial), (B) water recreation (contact and secondary), (C) growth and propagation of fish, shellfish, other aquatic life, and wildlife, and (D) harvesting for consumption of raw mollusks or other raw aquatic life.

5.3 Water Quality Status of Receiving Water

Any part of a water body for which the water quality does not or is not expected to meet applicable WQS is defined as a “water quality limited segment” and placed on the State’s impaired water body list. Ward Cove is included on the *Alaska’s Final 2010 Integrated Water Quality Monitoring and Assessment Report*, July 15, 2010.

Section 303(d) of the Clean Water Act (CWA) requires states to develop a Total Maximum Daily Load (TMDL) management plan to achieve state WQS when a water body is water quality limited and will not meet standards despite the implementation of TBELs and other pollution control requirements. A TMDL documents the amount of a pollutant a water body can assimilate without violating a state’s WQS, and allocates that load to existing and future discharge sources of the pollutant. A TMDL includes individual wasteload allocations (WLAs) for point sources, load allocations for nonpoint sources and background loads, and a margin of safety. TMDLs are a necessary first step toward water body recovery and are required for a water body to be ‘de-listed’ from the Alaska 303(d) Category 5 Impaired Waters List.

Ward Cove was initially included on DEC’s 1990 Section 303(d) list of water quality-limited waters for low dissolved oxygen and the presence of residues due to discharges from KPC’s dissolving sulfite pulp mill. By 1996, a water quality assessment of Ward Cove was completed. In 1996 the 303(d) list included Ward Cove as water quality-limited for four pollutant parameters: residues (wood residues), dissolved gas (dissolved oxygen), color, and toxic and other deleterious substances (sediment toxicity). The non-attainment of WQS for these parameters was the result of pulp residues, logs, bark and woody debris. Low dissolved oxygen was the result of historical discharges and associated activity from the KPC pulp mill operations and a seafood processing facility formally located in Ward Cove.

The 1998 303(d) list removed color as a pollutant because KPC’s mill wastewater discharges to the water body ceased in 1997. Dissolved oxygen (DO), toxics and other deleterious organic and inorganic substances and residues (debris) remained on the list and required the development of a water body recovery plan or TMDL. Sediment toxicity was removed from the 2004 303(d) list and placed in category 4b (other pollutant controls) because the Record of Decision for the Superfund sediment remediation project for Ward Cove was accepted as a pollution control requirement that achieved WQS for sediment toxicity.

Since discharges have ceased from both the pulp mill and the seafood processor, surface water dissolved oxygen has improved; however, Ward Cove remains Category 4a/Section 303(d) listed for non-attainment of residues and the dissolved gas standard for DO below the pycnocline, a stratification layer in the ocean in which water density increases rapidly with depth. A TMDL for residues and DO was developed and approved by EPA on May 15, 2007. The TMDL established a WLA for DO that prohibited: “point source loading of oxygen-demanding substances that will cause a measurable decrease (0.2 mg/L) in DO level below 5.0 mg/L from June through September.” The impaired waters were those waters below the pycnocline.

In 1994, EPA approved a TMDL for BOD₅ in the surface waters of Ward Cove, and in 2007, superseded this TMDL with a DO TMDL that addressed the entire water column. In developing the 2007 TMDL, DEC and EPA identified all permitted discharges to Ward Cove, including the discharge of wastewater from the Ward Cove WWTP. The TMDL concluded that the WWTP does not discharge wood residues, and the small amount of suspended sediment the WWTP is permitted to discharge is not considered relevant to the residues TMDL. The TMDL also

acknowledged that the permit for the WWTP requires that the standard for DO be met at the point of discharge (that no mixing zone is authorized). The TMDL outlines that it expects that the freshwater discharge of the Ward Cove WWTP will rise in the water and be contained above the pycnocline in the summer. The discharge is not expected to affect levels of DO significantly above or below the pycnocline in the summer months.

According to the Alaska's Final 2010 Integrated Water Quality Monitoring and Assessment Report, Ward Cove is classified as a Category 4a impaired water body for residues and dissolved gas. Category 4a water bodies are defined as being impaired but not needing a TMDL or an impaired water with a final approved TMDL. In the case of Ward Cove, a TMDL has been approved. In this permit, discharges from end of pipe Outfall 001B will not contribute to a depletion of DO.

5.4 Mixing Zone

In accordance with state mixing zone regulations 18 AAC 70.240, as amended through June 23, 2003, the Department may authorize a mixing zone in a permit. The applicant did not request a mixing zone. Accordingly, the Department has not considered authorization of a mixing zone for this permitting action. However, as documented in the previous fact sheet for the previously issued permit, sufficient mixing and dilution exists via the freshwater in the wood stave pipe to bring the commingled effluent into compliance with applicable water quality criteria prior to discharging into Ward Cove. Compliance monitoring at end of pipe Outfall 001B as required by Table 2 will continue to verify that sufficient mixing occurs within the wood stave pipe to bring the commingled effluent into compliance with applicable water quality criteria prior to discharge.

6.0 PERMIT REISSUANCE (ANTIBACKSLIDING)

18 AAC 83.480(a) requires that "...interim effluent limitations, standards, or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit, unless the circumstances on which the previous permit was based have materially and substantially changed since the permit was issued, and the change in circumstances would constitute cause for permit modification or revocation and reissuance under 18 AAC 83.135." Under 18 AAC 83.135(b)(2), the department has cause to modify a permit if, among other things, "...the department has received new information, other than revised regulations, guidance, or test methods, that was not available at the time of permit issuance, and the new information would have justified the imposition of different permit conditions at the time of issuance." As a result of new information that was unavailable previously, there are modifications to the conditions in this permit that are less stringent than conditions contained in the previous permit. These modifications include:

The removal of the end of pipe Outfall 001B BOD₅ monitoring requirement is based on consistency with 18 AAC 83.480(a) and 18 AAC 83.135(b)(2). (Further explanation for this change is detailed in Section 4.4.). With the exception of the above modification the effluent limitations, standards, and conditions in this permit are as stringent as those included in the previous permit.

7.0 ANTIDegradation

Section 303(d)(4) of the CWA states that, for water bodies where the water quality meets or exceeds the level necessary to support the water body's designated uses, WQBELs may be revised as long as the revision is consistent with the State's antidegradation policy. The Antidegradation Policy of the WQS (18 AAC 70.015) states that the existing water uses and the level of water quality necessary to protect existing uses must be maintained and protected. This section analyzes and provides rationale for the Department's decisions in the permit issuance with respect to the Antidegradation Policy.

The Department's approach to implementing the Antidegradation Policy, found in 18 AAC 70.015, is based on the requirements in 18 AAC 70 and the Department's *Policy and Procedure Guidance for Interim Antidegradation Implementation Methods*, (*Interim Methods*) dated July 14, 2010. Using these procedures and policy, the Department determines whether a water body, or portion of a water body, is classified as Tier 1, Tier 2, or Tier 3, where a higher numbered tier indicates a greater level of water quality protection. At this time, no Tier 3 waters have been designated in Alaska.

Ward Cove requires both a Tier 1 and Tier 2 antidegradation analysis. The *Interim Methods* defines the lowest level of protection (Tier 1) as: "appl(ying) to water bodies whose existing quality is no better than the state-wide water quality criteria for the designated uses of 'growth and propagation of fish, shellfish, other aquatic life and wildlife' [see 18 AAC 70.020(a)(1)(C)] and contact recreation [see 18 AAC 70.020(a)(1)(B)(i)]...often referred...together as the 'fishable/swimmable' uses." Ward Cove is designated as a Category 4a impaired water body for DO. As such, Ward Cove is considered a Tier 1 water body for the parameter of DO.

A TMDL was developed and approved by EPA on May 15, 2007 (see Section 5.3). The TMDL established allocation WLA for DO that prohibited: "point source loading of oxygen-demanding substances that will cause a measurable decrease (0.2 mg/L) in DO level below 5.0 mg/L from June through September." The impaired waters are those waters below the pycnocline. The TMDL outlines that it expects that the freshwater discharge of the Ward Cove WWTP will rise in the receiving water and be contained above the pycnocline in the summer. The discharge is not expected to affect levels of DO significantly above or below the pycnocline in the summer months.

In this issuance, the Department implements a more stringent minimum effluent limit for DO (6 mg/L instead of the previous permit limit of 5 mg/L) that is based on the water quality criteria for uses of the receiving water. Since these effluent limits would be met at the end of pipe Outfall 001B before final discharge into Ward Cove, the existing uses and the level of water quality necessary to support them are maintained and protected. There will be no increase in the discharge of DO from what had previously been permitted.

For the remaining pollutants that effluent limits were established for in the permit, DEC has determined that the receiving waters of Ward Cove are Tier 2 waters based on the guidance, information provided by the applicant, and DEC knowledge of the water bodies. The State's Antidegradation Policy in 18 AAC 70.015(a)(2) states that if the quality of water exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water (i.e. Tier 2 waters), that quality must be maintained and protected. The Department may allow a reduction of water quality only after finding that five specific requirements of the antidegradation policy at 18 AAC 70.015(a)(2)(A)-(E) are met. The Department's findings follow:

18 AAC 70.015 (a)(2)(A). Allowing lower water quality is necessary to accommodate important economic or social development in the area where the water is located.

The Department has determined the lowering of water quality is necessary given the treatment facility's proximity to Ward Cove, and on the premise the facility is fully constructed and operational. It would be an extreme financial hardship for Full Cycle LLC to implement other treatment measures. The permittee has not proposed an increase in discharge volume, and the concentrations of pollutants discharged are largely similar to the previous permit.

The Ward Cove WWTP offers a septic tank sludge disposal and treatment location for many on-site systems located throughout the Ketchikan Gateway Borough. Onsite domestic wastewater treatment units are prevalent in this area due to the practical and economic infeasibility of providing municipal sewer connections and treatment. Ward Cove WWTP also provides a facility to treat marine vessel domestic waste. Eliminating or requiring implementation of alternatives to the existing discharge would inhibit important socioeconomic growth and development in the area. The Department concludes that this finding is met.

18 AAC 70.015 (a)(2)(B). Except as allowed under this subsection, reducing water quality will not violate the applicable criteria of 18 AAC 70.020 or 18 AAC 70.235 or the whole effluent toxicity limit in 18 AAC 70.030.

Discharge allowed by the permit conforms to the requirements of 18 AAC 70.020. No water quality variance in the form of a mixing zone is authorized and all water quality criteria are required to be met at the end of pipe Outfall 001B prior to discharge. Site-specific criteria as allowed by 18 AAC 70.235 have not been established for Ward Cove. It is not anticipated that the discharge is toxic (See Section 4.5 above). Adherence to permit limits and conditions will ensure there are not violations of the WET limit in 18 AAC 70.030. The Department concludes that the reduction of water quality will not violate the applicable criteria specified in 18 AAC 70.015 (a)(2)(B) and that the finding is met.

18 AAC 70.015(a)(2)(C). The resulting water quality will be adequate to fully protect existing uses of the water.

The permit reissuance application does not propose any changes that would likely result in wastewater of lower quality to be discharged than has been discharged under the previously issued permit. The WQS, upon which the permit effluent limits are based, serve the specific purposes of protecting the existing and designated uses. No water quality variance in the form of a mixing zone is authorized and all water quality criteria will be met at the end of pipe Outfall 001B prior to discharge. After a review of the expected volume of discharge, the types and amounts of regulated pollutants, and the effluent limits imposed in this permit, the Department concludes that the resulting water quality will be adequate to fully protect existing uses and that the finding is met.

18 AAC 70.015(a)(2)(D). The methods of pollution prevention, control, and treatment found by the Department to be most effective and reasonable will be applied to all wastes and other substances to be discharged.

The Department finds the most effective and reasonable methods of prevention, control, and treatment are the practices and requirements set out in the APDES permit. This type of treatment (e.g., biological, secondary treatment) and associated discharge is similar in nature to other like facilities and their discharges located throughout the United States. The permittee is also required to develop and implement a QAPP and a BMP Plan developed to guide the permittee on proper monitoring protocols and best waste management practices. The Department concludes that the most effective and reasonable methods of pollution prevention, control, and treatment are applied and that the finding is met.

18 AAC 70.015(a)(2)(E). All wastes and other substances discharged will be treated and controlled to achieve (i) for new and existing point sources, the highest statutory and regulatory requirements; and (ii) for nonpoint sources, all cost-effective and reasonable best management practices.

The applicable “highest statutory and regulatory treatment requirements” are defined in 18 AAC 70.990(30) (as amended June 26, 2003) and in the July 14, 2010, DEC guidance titled *Interim Antidegradation Implementation Methods*. Accordingly, there are three parts to the definition, which are:

(A) any federal technology-based effluent limitation guidelines (ELG) identified in 40 CFR § 125.3 and 40 CFR §122.29, as amended through August 15, 1997, adopted by reference;

(B) minimum treatment standards in 18 AAC 72.040; and

(C) any treatment requirements imposed under another state law that is more stringent than a requirement of this chapter.

The first part of the definition includes all federal technology-based ELGs. Upon Department review, no federal technology-based ELGs directly apply to these types of discharges; however, per 40 CFR §125.3(c)(2), which is adopted by reference in 18 AAC 83.010(c), the Department is also using best professional judgment (BPJ) under section 402(a)(1) of the CWA to implement case-by-case technology-based secondary treatment requirements for non-POTWs (i.e. privately-owned treatment facilities) authorized to discharge domestic wastewater under this permit.

The second part of the definition 18 AAC 70.990(B) (2003) appears to be in error, as 18 AAC 72.040 describes discharges to sewers and not minimum treatment. The correct reference appears to be the minimum treatment standards found at 18 AAC 72.050, which refers to domestic wastewater discharges only. The authorized domestic wastewater discharge is in compliance with the minimum treatment standards found in 18 AAC 72.050 as reflected by the permit limits specifying secondary treatment standards.

The third part includes any more stringent treatment required by state law, including 18 AAC 70 and 18 AAC 72. The correct operation of equipment, water quality monitoring, implementation of secondary treatment standards for the domestic wastewater discharge (18 AAC 72.050), and implementation of applicable BMPs, will control the discharge and satisfy all applicable federal and state permit conditions and requirements. See the rationale detailed above in item 2. This achieves the highest statutory and regulatory requirements.

After review of the applicable statutory and regulatory requirements, including 18 AAC 70, 18 AAC 72, and 18 AAC 83, the Department finds that the discharge from the existing point source meets the highest applicable statutory and regulatory requirements and that this finding is met.

8.0 OTHER PERMIT CONDITIONS

8.1 Quality Assurance Project Plan

The permittee is required to develop procedures to ensure that the monitoring data submitted are accurate and to explain data anomalies if they occur. The permittee is required to update the QAPP within 90 days of the effective date of the final permit. Additionally, the permittee must submit a notification letter to the Department within 90 days of the effective date of the permit stating that the plan has been implemented within the required time frame. The QAPP shall consist of standard operating procedures the permittee must follow for collecting, handling, storing and shipping samples; laboratory analysis; and data reporting. An existing QAPP may be reviewed and updated to meet the development requirements. The plan shall be retained onsite and made available to the Department upon request.

8.2 Best Management Practices Plan

In accordance with AS 46.03.110 (d), the Department may specify in a permit the terms and conditions under which waste material may be disposed. This permit requires the permittee to develop a BMP Plan in order to prevent or minimize the potential for the release of pollutants to waters and lands of the State of Alaska through plant site runoff, spillage or leaks, or erosion. The permit contains certain BMP conditions that must be included in the BMP Plan. The permit requires the permittee to submit written notice to the Department that the BMP Plan has been developed or updated and implemented within 120 days of the effective date of the final permit. The plan must be reviewed and updated annually and must be kept onsite at a protected location which is accessible to personnel and made available to the Department upon request.

8.3 Standard Conditions

Appendix A of the permit contains standard regulatory language that must be included in all APDES permits. These requirements are based on the regulations and cannot be challenged in the context of an individual APDES permit action. The standard regulatory language covers requirements such as monitoring, recording, reporting requirements, compliance responsibilities, and other general requirements.

9.0 OTHER LEGAL REQUIREMENTS

9.1 Endangered Species Act

The Endangered Species Act requires federal agencies to consult with the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) if their actions could beneficially or adversely affect any threatened or endangered species. As a state agency, DEC is not required to consult with these federal agencies regarding permitting actions; however, DEC voluntarily contacted the agencies to notify them of this permit issuance and to obtain listings of threatened and endangered species near the proposed discharge.

In an email dated February 18, 2014, a Marine Mammal Specialist with NOAA Marine Fisheries reported that Endangered Species Act (ESA)-listed marine mammal species that may occur in the Ward Cove area include the endangered humpback whale (*Megaptera novangliaea*). NOAA

stated that several ESA-listed stocks of Pacific salmon from Evolutionarily Significant Units may occur within Alaska's waters but the specific occurrences of listed salmonids within the project area is unknown.

In an email dated February 9, 2014, a biologist from the USFWS directed the Department to consult a [website](#) to obtain lists of threatened and endangered species within the jurisdiction of the USFWS in the Ward Cove area. The Department used this [website](#) to determine that there does not appear to be any endangered or threatened species or critical habitat areas under USFWS jurisdiction in the area of Ward Cove that the facility discharges to.

9.2 Essential Fish Habitat

Essential fish habitat (EFH) includes the waters and substrate (sediments, etc.) necessary for fish from commercially-fished species to spawn, breed, feed, or grow to maturity. The Magnuson-Stevens Fishery Conservation and Management Act (January 21, 1999) requires federal agencies to consult with NOAA when a proposed discharge has the potential to adversely affect (reduce quality and/or quantity of) EFH. As a state agency, DEC is not required to consult with NOAA NMFS regarding permitting actions. However, the Department voluntarily contacted NMFS and received an email response on February 18, 2014 that indicated the freshwater stream that runs into the head of Ward Cove and the tributaries of this stream support spawning and rearing of sockeye (*Oncorhynchus nerka*), coho (*Oncorhynchus kisutch*), pink (*Oncorhynchus gorbuscha*), and chum salmon (*Oncorhynchus keta*), as well as Dolly Varden trout (*Salvelinus malma*) and steelhead. All these anadromous fishes migrate through Ward Cove as rearing smolt and adults returning to spawn. Juvenile salmon also use nearshore habitat during spring and early summer for feeding and predator avoidance prior to migration out to sea.

9.3 Sludge (Biosolids) Requirements

Sludge means any solid, semi-solid, or liquid residue removed during the treatment of municipal wastewater or domestic sewage. State and federal requirements regulate the management and disposal of sewage sludge (biosolids). The permittee must consult both state and federal regulations to ensure proper management of the biosolids and compliance with applicable requirements.

9.3.1 State Requirements

The Department separates wastewater and biosolids permitting. The permittee should contact the Department's Solid Waste Program for information regarding state regulations for biosolids. The permittee can access the Department's [Solid Waste Program web page](#) for more information and who to contact.

9.3.2 Federal Requirements

EPA is the permitting authority for the federal sewage sludge regulations at 40 CFR Part 503. Biosolids management and disposal activities are subject to the federal requirements in Part 503. The Part 503 regulations are self-implementing, which means that a permittee must comply with the regulations even if no federal biosolids permit has been issued for the facility.

The permittee should ensure that a biosolids permit application has been submitted to EPA. In addition, the permittee is required to submit a biosolids permit application to EPA for the use or disposal of sewage sludge at least 180 days before this APDES permit expires in accordance

with 40 CFR §§122.21(c)(2) and 122.21(q) [see also 18 AAC 83.110(c) and 18 AAC 83.310, respectively]. The application form is NPDES Form 2S and can be found on EPA's website, www.epa.gov, under NPDES forms. A completed NPDES Form 2S should be submitted to:

U.S. Environmental Protection Agency,
Region 10, NPDES Permits Unit OWW-130,
Attention: Biosolids Contact,
1200 Sixth Avenue, Suite 900,
Seattle, WA 98101-3140.

The EPA Region 10 telephone number is 1-800-424-4372.

Information about EPA's biosolids program and CWA Part 503 is available at www.epa.gov and either search for 'biosolids' or go to the EPA Region 10 website link and search for 'NPDES Permits'.

9.4 Permit Expiration

The permit will expire five years from the effective date of the permit.

10.0 References

1. Alaska Department of Environmental Conservation, 2003. *Alaska Water Quality Criteria Manual for Toxics and Other Deleterious Organic and Inorganic Substances*, as amended through December 12, 2008.
2. Alaska Department of Environmental Conservation, 2003. 18 ACC 70. *Water Quality Standards*, as amended through June 26, 2003.
3. Alaska Department of Environmental Conservation, 2012. 18 ACC 72. *Wastewater Disposal*, as amended through April 8, 2012.
4. U.S. Environmental Protection Agency. 1991. *Technical Support Document for Water Quality-based Toxics Control*. Office of Water Enforcement and Permits, Office of Water Regulations and Standards. Washington DC, March 1991. EPA/505/2-90-001.
5. Alaska Department of Environmental Conservation, 2010. *Alaska's Final 2010 Integrated Water Quality Monitoring and Assessment Report*. July 15, 2010.
6. Alaska Department of Environmental Conservation, 2007. *Total Maximum Daily Loads (TMDLs) for Residues and Dissolved Oxygen in the Waters of Ward Cove near Ketchikan, Alaska, Revised Final*. March 2007.
7. Alaska Department of Environmental Conservation, 2013. *Alaska Pollutant Discharge Elimination System (APDES) Permits Reasonable Potential Analysis and Effluent Limits Development Guide*. September 3, 2013.
8. Alaska Department of Environmental Conservation, 2010. *Interim Antidegradation Implementation Methods*. July 14, 2010.
9. U.S. Environmental Protection Agency, 1994. *Total Maximum Daily Load (TMDL) for Biochemical Oxygen Demand (BOD₅) in the surface waters of Ward Cove, Alaska*. 1994.
10. U.S. Fish and Wildlife Service, 2014. *Information, Planning and Conservation System Initial Project Scoping website*. <http://ecos.fws.gov/ipac/wizard/chooseLocation!prepare.action> as retrieved on February 28, 2014.
11. Water Pollution Control Federation. 1976. *Chlorination of wastewater, manual of practice no. 4*. Moore & Moore, Washington D.C.

APPENDIX A. FACILITY INFORMATION

Figure 1: Ward Cove Wastewater Treatment Plant Map

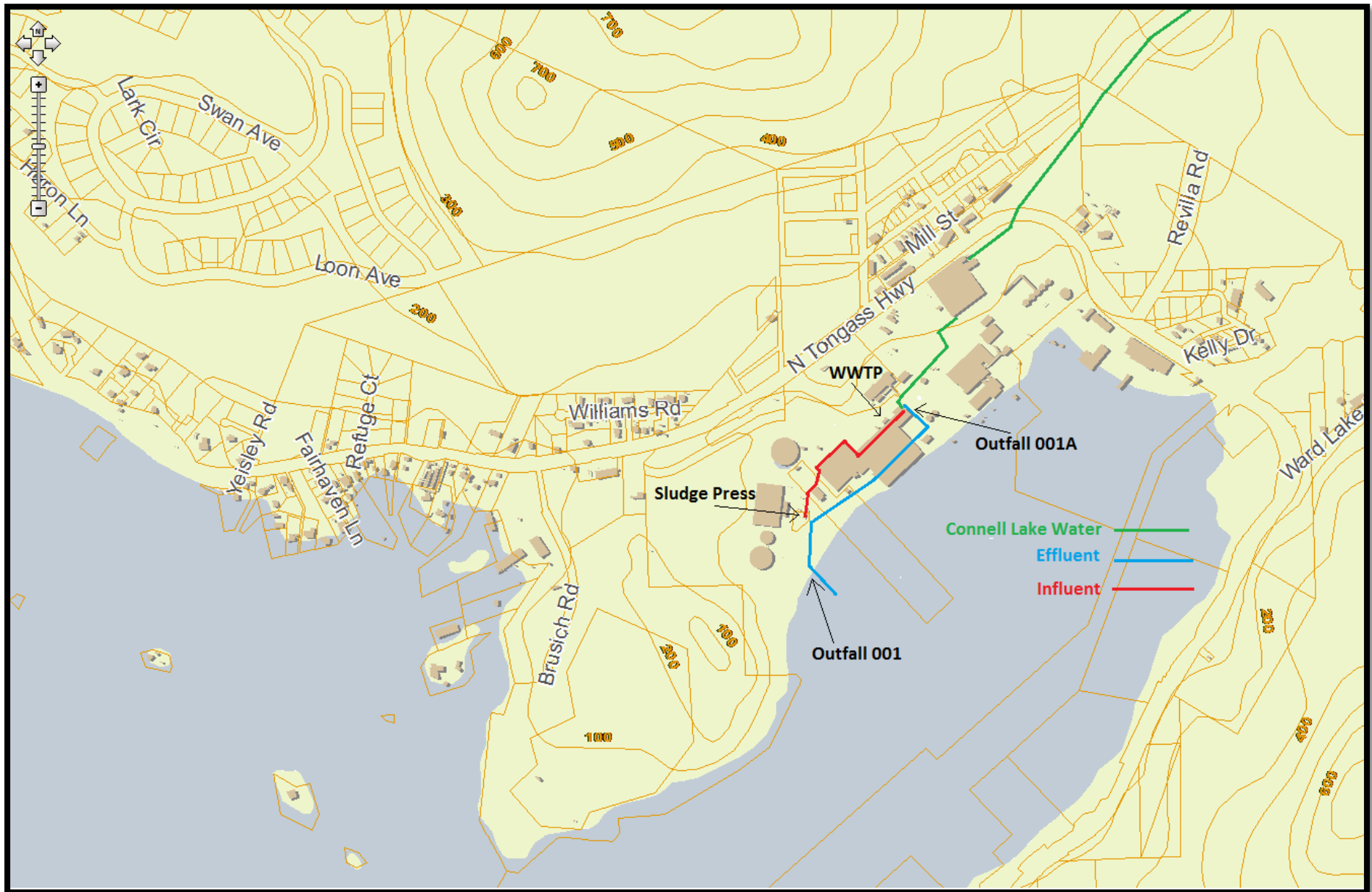
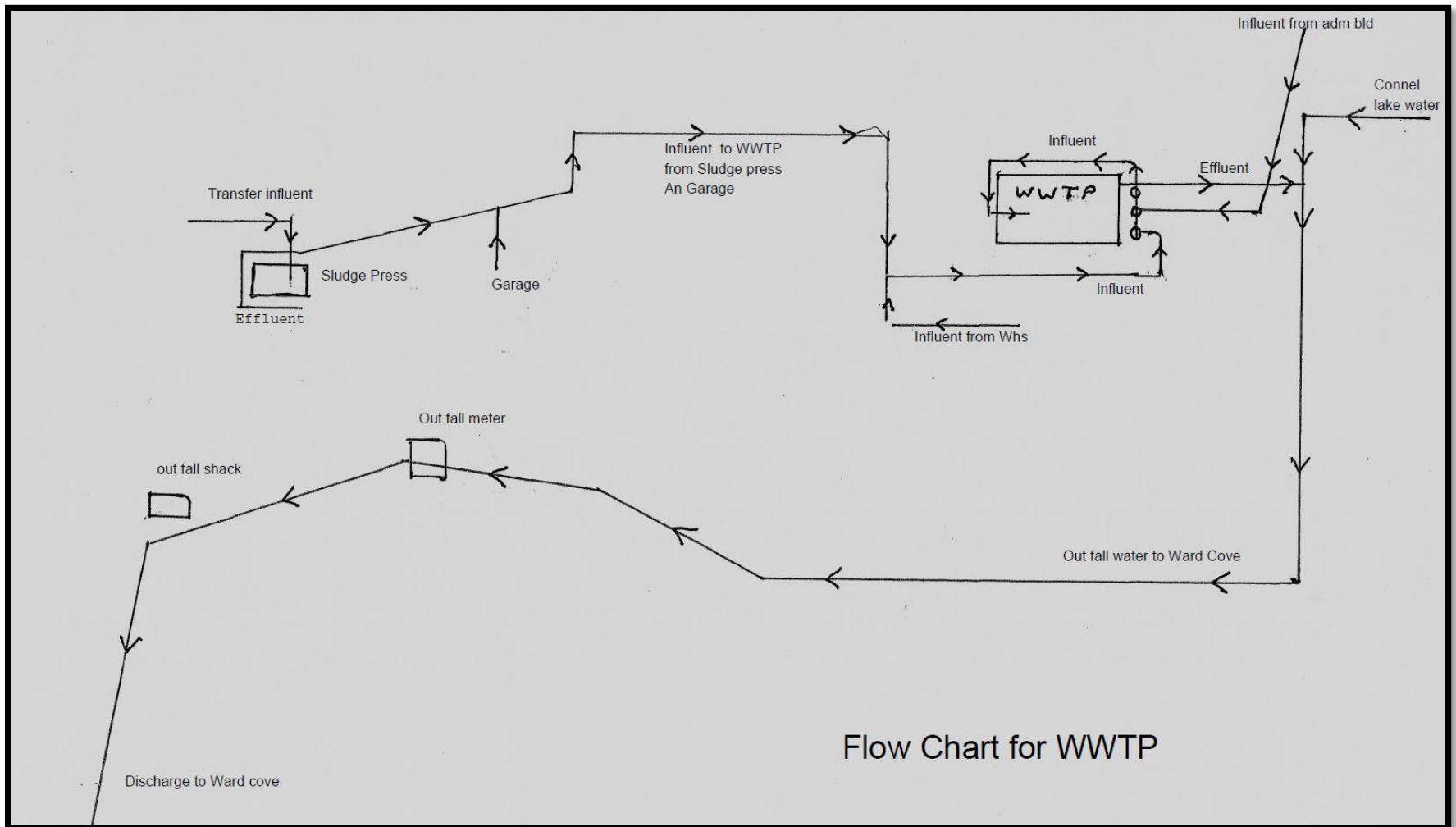


Figure 2: Ward Cove Wastewater Treatment Plant Process Flow Diagram



APPENDIX B. BASIS FOR EFFLUENT LIMITATIONS

The Clean Water Act (CWA) requires that the effluent limit for a particular pollutant be the more stringent of either technology-based effluent limits (TBELs) or water quality-based effluent limits (WQBELs). TBELs are established by the Environmental Protection Agency (EPA) for many industries in the form of Effluent Limitation Guidelines (ELG) and are based on available pollution control technology. The Department adopts the subject ELGs by reference in 18 AAC 83.010.

In accordance with Alaska Pollutant Discharge Elimination System (APDES) regulations at 18 AAC 83.475, best management practices (BMPs) can be used to control or abate the discharge of pollutants in several circumstances, including, when numeric effluent limits are infeasible. BMPs are defined at 18 AAC 83.990(9) as schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States (U.S.). CWA Section 304 (e) authorizes the inclusion of BMPs as requirements in discharge permits.

The Department may find, by analyzing the effect of an effluent discharge on the receiving water body, that secondary treatment effluent limits or other TBELs are not sufficiently stringent to meet water quality standards (WQS). In such cases, the Department is required to develop more stringent WQBELs, which are designed to ensure that the WQS of the receiving water body are met.

Secondary treatment effluent limits do not limit every parameter that may be present in the effluent. Limits have been developed for five-day biochemical oxygen demand (BOD₅), total suspended solids (TSS), and pH. Effluent may contain other pollutants, such as bacteria or metals, depending on the type of treatment system used and the characteristics of the influent to the treatment system. When TBELs do not exist for a particular pollutant expected to be in the effluent, the Department must determine if the pollutant may cause or contribute to an exceedance of a WQS for the water body. If the Department determines a pollutant causes or contributes to an exceedance of a WQS, a WQBEL for the pollutant must be developed.

B.1 Technology-Based Effluent Limits

Section 301 of the CWA established a required performance level, referred to as “secondary treatment,” that all Publicly Owned Treatment Works (POTWs) were required to meet by July 1, 1977. The Department has adopted the “secondary treatment” effluent requirements by reference in 18 AAC 83.010(e). The TBELs apply to all POTWs and identifies the minimum level of effluent quality attainable by application of secondary treatment in terms of BOD₅, TSS, and pH. In addition to having adopted the federal secondary treatment regulations in 40 CFR Part 133, the State of Alaska requires maximum daily limitations of 60 mg/L for BOD₅ and TSS in its own secondary treatment regulations (18 AAC 72.990).

The secondary treatment standards are not directly applicable to the Ward Cove Wastewater Treatment Plant (WWTP) since the facility is not a POTW. However, because the wastewater characteristics are identical to POTW, the Department is establishing case-by-case TBELs based on Best Professional Judgment (BPJ) consistent with the requirements found in 40 CFR §133.102 (adopted in 18 AAC 83.010) and 18 AAC 72.990. The TBELs are applicable to internal Outfall 001A, domestic wastewater discharge, before any mixing occurs with the freshwater diverted from Lake Connell in the wooden stave discharge pipe and are listed in Table B-1. Application of secondary treatment standards at internal Outfall 001A rather than the end of pipe marine discharge from Outfall 001B to Ward Cove is appropriate because the domestic wastewater at

internal Outfall 001A is treated separately and then combined with water prior to final marine discharge.

18 AAC 83.550(a) states: “When permit effluent limitations or standards imposed at the point of discharge are impractical or infeasible, effluent limitations or standards for dischargers of pollutants may be imposed on internal wastestreams before mixing with other wastestreams...” As such, and as in the previous permit, internal Outfall 001A is established to apply the secondary treatment standards and to ensure that other water does not dilute the domestic waste stream to the point where the pollutants are not detectable.

B.1.1 Total Residual Chlorine

The Ward Cove WWTP, like many domestic wastewater plants, uses chlorine to disinfect wastewater prior to discharge. With respect to internal Outfall 001A, the Department was unable to conduct a reasonable potential analysis with the end-of-pipe Total Residual Chlorine (TRC) data available in the permittee’s Discharge Monitoring Reports (DMRs). The TRC data was inconsistent, either having been left blank on the DMR, recorded as a series of zeroes, etc. This permit term will be used to gather TRC data to perform a reasonable potential analysis in the next permit issuance. Nevertheless, the permit contains a chlorine WQBEL equal to the chronic chlorine water quality criteria for end of pipe Outfall 001B to ensure applicable criteria are met prior to discharge into Ward Cove.

For internal Outfall 001A, a 0.5 mg/L TRC average monthly limit is derived from standard operating practices. The Water Pollution Control Federation’s Chlorination of Wastewater (1976) states that a properly designed and maintained wastewater treatment plant can achieve adequate disinfection if a 0.5 mg/L chlorine residual is maintained after 15 minutes of contact time. Therefore, a wastewater treatment plant that provides adequate chlorine contact time can meet a 0.5 mg/L TRC limitation on a monthly average basis. These limits serve as Best Professional Judgment (BPJ) case-by-case TBELs consistent with the requirements found in 40 CFR §133.102 (adopted in 18 AAC 83.010) and State 18 AAC 72.990. In addition to average monthly limitations (AMLs), DEC regulations at 18 AAC 83.530 require that effluent limitations for POTWs to be expressed as average weekly limits (AWLs) unless impracticable. The AWL is calculated to be 1.5 times the AML, consistent with the “secondary treatment” limitations for BOD₅ and TSS. This results in an AWL for chlorine of 0.75 mg/L.

B.1.2 Fecal Coliform Bacteria

The previous permit applied fecal coliform limits of 200 fecal coliform per 100 milliliters (FC/100 mL) (AML), 400 FC/100 mL (AWL) and 800 FC/100 mL (daily maximum limit). The basis for these limits was not described in the previous permit’s fact sheet, but the likely basis for the limits, which are widely implemented in other domestic wastewater discharge permits, is the definition of disinfection found in 18 AAC 72.990 (21)(A) & (B). The definition states that facilities that disinfect using different technologies, including chlorination, designed to eliminate pathogenic organisms, can produce effluent with the characteristics of meeting an AML of 200 FC/100 mL and an AWL of 400 FC/100 mL. As such, these limits serve as BPJ case-by-case TBELs consistent with the requirements found in 40 CFR §133.102 (adopted in 18 AAC 83.010) and State 18 AAC 72.990.

Table B-1: Technology Based Effluent Limits at Internal Outfall 001A

Parameter	Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit
BOD ₅	30 Milligrams per Liter (mg/L)	45 mg/L	60 mg/L
TSS	30 mg/L	45 mg/L	60 mg/L
Removal Rates for BOD ₅ and TSS	85% (minimum)	N/A	N/A
pH	Within the range of 6.0 – 9.0 Standard Units (SU)		
Total Residual Chlorine	0.5 mg/L	0.75 mg/L	1.0 mg/L
Fecal Coliform Bacteria	200 FC/100 mL	400 FC/100 mL	800 FC/100 mL

B.1.3 Mass-Based Limitations

The regulation at 18 AAC 83.540 requires that effluent limits be expressed in terms of mass, if possible. The regulation at 18 AAC 83.520 requires that effluent limits be calculated based on the design flow of the facility. The mass based limits are expressed in pounds per day (lbs/day) and are calculated as follows:

Mass based limit (lbs/day) = concentration limit (mg/L) × design flow (flow in million gallons per day (mgd)) × 8.341¹

B.2 Water Quality – Based Effluent Limitations

B.2.1 Statutory and Regulatory Basis

18 AAC 70.010 prohibits conduct that causes or contributes to a violation of the WQS.

18 AAC 70.090 requires that permits include terms and conditions to ensure criteria are met, including operating, monitoring, and reporting requirements. The regulations require the permitting authority to make this evaluation using procedures that account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and where appropriate, dilution in the receiving water body. The limits must be stringent enough to ensure that WQS are met and must be consistent with any available wasteload allocation (WLA).

B.2.2 Reasonable Potential Analysis

When evaluating the effluent to determine if WQBELs based on chemical-specific numeric criteria are needed, the Department projects the receiving water body concentration for each pollutant of concern downstream of where the effluent enters the receiving water body. The chemical-specific concentration of the effluent and receiving water body and, if appropriate, the dilution available from the receiving water body, are factors used to project the receiving water body concentration. If the projected concentration of the receiving water body exceeds the numeric criterion for a limited parameter, then there is a reasonable potential that the discharge may cause or contribute to an excursion above the applicable water quality standard, and a WQBEL must be developed. The discharge from end of pipe Outfall 001B is required to meet

¹ 8.341 is a conversion factor with units (lb x L) / (mg x gallon x 10⁶)

WQBELs set equal to applicable water quality criteria at the end-of-pipe for total residual chlorine, dissolved oxygen, fecal coliform bacteria and pH.

Very limited effluent monitoring data was available from a one-time sampling event for metals required by the previous permit. Detected results of this effluent monitoring are depicted in Table B-2 below. Results for copper exceeded the WQS aquatic life acute numeric criteria (4.8 micrograms per liter (µg/L)) and the chronic criteria (3.1 µg/L). As this effluent monitoring provided only one data point for analysis, per the Department of Environmental Conservation (DEC) Reasonable Potential Analysis Procedure, a permit limit was not established, but more frequent monitoring specific to copper is being required to gather data during this permit cycle in order to perform a reasonable potential analysis during the next permit issuance. Monitoring the discharge quarterly for copper will ultimately produce a dataset of 20 effluent data points for evaluation during the next permit issuance, which is a statistically robust dataset for completing a reasonable potential analysis.

Table B-2: August 2013 Effluent Metals Monitoring Results

Parameter	Internal Outfall 001A	End of Pipe Outfall 001B	Units
Arsenic	5.8	Not Detected	µg/L
Lead	Not Detected	4.5	µg/L
Antimony	2	Not Detected	µg/L
Chromium	Not Detected	.64	µg/L
Copper	17	14	µg/L
Zinc	76	52	µg/L

According to 18 AAC 70.990(38), a mixing zone is an area in a water body surrounding, or downstream of, a discharge where the effluent plume is diluted by the receiving water within which specified water quality criteria may be exceeded. Water quality criteria and limits may be exceeded within a mixing zone. A mixing zone can be authorized only when adequate receiving water body flow exists, and the concentration of the pollutant of concern in the receiving water body is below the numeric criterion necessary to protect the designated uses of the water body. The applicant has not requested a mixing zone so the Department did not consider mixing zone authorization and the discharge must meet water quality criteria at the end-of-pipe.

B.2.3 Specific Water Quality-Based Effluent Limits

B.2.3.1 Floating, Suspended or Submerged Matter, including Oil and Grease

The Alaska WQS require surface waters to be free from floating solids, debris, sludge deposits, foam, scum, or other residues of any kind in concentrations causing nuisance, objectionable, or detrimental conditions or that make the water unfit or unsafe for the use. The permit requires that the facility meet a narrative standard for floating solids, visible foam, and oily wastes, which is similar to a requirement in the previous permit.

B.2.3.2 *pH*

The criteria for water supply, aquaculture, and growth and propagation of fish, shellfish, other aquatic life, and wildlife are the most stringent standards for pH. These standards at 18 AAC 70.020(b)(18) state that marine waters, “May not be less than 6.5 or greater than 8.5 SU.”

B.2.3.3 *Dissolved Oxygen*

The criteria for aquaculture water supply are the most stringent standards for dissolved oxygen (DO). The standards at 18 AAC 70.020(b)(15)(A)(i) require that DO must be greater than 6 mg/L in receiving waters for a depth of one meter except when natural conditions cause this value to be depressed. In no case may DO be greater than 17 mg/L. The concentration of total dissolved gas may not exceed 110% of saturation at any point of sample collection. The 2007 Total Maximum Daily Load (TMDL) developed for Ward Cove requires that “no point source loading of oxygen-demanding substances that will cause a measurable decrease (0.2 mg/L) in dissolved oxygen level below 5.0 mg/L from June through September.”

B.2.3.4 *Fecal Coliform Bacteria*

Fecal coliform bacteria is a non-pathogenic indicator species whose presence suggests the likelihood that pathogenic bacteria are present. The WQS at 18 AAC 70.020(b)(14)(D) for harvesting of raw mollusk or other aquatic life criterion specifies that the fecal coliform bacteria concentration shall not exceed 14 FC/100 mL and not more than 10% of samples shall exceed a fecal coliform bacteria concentration of 43 FC/100 mL. End of pipe Outfall 001B fecal coliform bacteria WQBELs equal to the water quality criteria are in place to ensure adequate water body production. The Compliance Program has discussed monitoring requirements with the permittee and this permit term will be used to gather fecal coliform bacteria data to perform a reasonable potential analysis in the next permit issuance.

B.2.3.5 *Total Residual Chlorine*

The most stringent state water quality numeric criteria for TRC to protect designated uses requires that concentrations may not exceed 7.5 µg/L for chronic aquatic life [18AAC 70.020(b)(23)(C)].

B.2.3.6 *Enterococci Bacteria*

Enterococci bacteria monitoring has been added to the permit based on the EPA promulgation of enterococci bacteria standards for marine waters to protect primary contact recreation. On October 10, 2000, the Beaches Environmental Assessment and Coastal Health Act (BEACH Act) was signed into law, amending the CWA. The BEACH Act addressed pathogens and pathogen indicators in coastal recreation water.

Water quality criteria for bacteria are based on levels of indicator bacteria, which demonstrate the presence of pathogens in fecal pollution. Fecal coliform bacteria have been the recommended indicator organism in the past. DEC has not adopted WQS for enterococci bacteria in 18 AAC 70. Therefore, as a delegated program, the DEC must apply the federal standard, as provided in 40 CFR §131.41. In this permit, monitoring the effluent

for both fecal coliform bacteria and enterococci bacteria are required to evaluate which organism will ultimately be monitored and what limits will be applied in the next permit.

Due to a lack of data on enterococci concentrations to base limits during this permit cycle, monitoring and reporting test results for enterococci bacteria from the effluent will be required. Sampling will be required during the months of May through September when the receiving water would most likely be used for primary contact recreation. Sampling for fecal coliform and enterococci bacteria shall occur on the same day.

B.2.4 Selection of Most Stringent Limitations

B.2.4.1 *BOD₅ and TSS*

The permit applies the TBELs for BOD₅ and TSS at the internal Outfall 001A.

Table B-3: Selection of BOD₅ and TSS Permit Limits

Parameter	Average Monthly Limit	Average Weekly Limit	Maximum Daily Limit
BOD ₅	30 Milligrams per Liter (mg/L)	45 mg/L	60 mg/L
TSS	30 mg/L	45 mg/L	60 mg/L
Removal Rates for BOD ₅ and TSS	85% (minimum)	N/A	N/A

B.2.4.2 *pH*

The TBEL limits of between 6.0 and 9.0 SU shall apply at the internal Outfall 001A, and are identical to those required in the last permit. The pH WQBELs of a minimum of 6.5 and maximum 8.5 SU shall apply at the end of pipe Outfall 001B and are also identical to the limits in the previous permit.

Table B-4: Selection of pH Permit Limits

Selection of pH Permit Limits	Minimum Daily (SU)	Maximum Daily (SU)
TBELs	6.0	9.0
WQBELs	6.5	8.5
Selected Limits (Internal Outfall 001A)	6.0	9.0
Selected Limits (End of Pipe Outfall 001B)	6.5	8.5

B.2.4.3 *Fecal Coliform Bacteria*

The previous permit's fecal coliform bacteria limits at the end of pipe Outfall 001B are identical to the applicable water quality criteria. This permit also continues the application of case-by-case BPJ TBELs at internal Outfall 001A.

Table B-5: Selection of Fecal Coliform Permit Limits

Selection of Fecal Coliform Permit Limits	Average Monthly (FC/100 mL)	Average Weekly (FC/100 mL)	Maximum Daily (FC/100 mL)
Case by Case BPJ TBELs	200	400	800
WQBELs	14	N/A	43
Selected Limits (Internal Outfall 001A)	200	400	800
Selected Limits (End of Pipe Outfall 001B)	14	N/A	43

B.2.4.4 Total Residual Chlorine

The permit continues to apply TBELs for TRC at internal Outfall 001A. The permit applies a TRC WQBEL equal to the applicable water quality criteria at the end of pipe Outfall 001B prior to final discharge into Ward Cove. The previous permit contained no average monthly limit for TRC, which is appropriate because monitoring only occurs twice per year. Additionally, the maximum daily limit of .0075 mg/L is protective of the most stringent WQS numeric criteria, the chronic criteria. DEC has not verified that compliance with the effluent limit for TRC can be determined using EPA-approved analytical methods. Thus the minimum detection limit of the EPA-approved analytical method used, or 0.1 mg/L, whichever is lower, is the compliance limit for this parameter.

Table B-6: Selection of Chlorine Permit Limits

Selection of Chlorine Permit Limits	Average Monthly (mg/L)	Average Weekly (mg/L)	Maximum Daily (mg/L)
TBELs	0.5	0.75	1.0
WQBELs	0.0075	N/A	0.013
Selected Limits (Internal Outfall 001A)	0.5	0.75	1.0
Selected Limits (End of Pipe Outfall 001B)	N/A	N/A	0.0075

B.2.4.5 Dissolved Oxygen

The previous permit contained DO limits at the end of pipe Outfall 001B that required a minimum of 5.0 mg/L and a maximum of 17 mg/L. The minimum DO limit of 5.0 mg/L is not as stringent as the WQS numeric criteria of a minimum of 6.0 mg/L, so the more stringent WQBELs are applied in this permit. The previous internal Outfall 001A permit limit of a minimum DO of 2.0 mg/L was carried forward.

Table B-7: Selection of Dissolved Oxygen Permit Limits

Selection of Dissolved Oxygen Permit Limits	Minimum Value (mg/L)	Maximum Value (mg/L)
Previous Permit Limits (End of Pipe Outfall 001B)	5.0	17.0
Previous Permit Limits (Internal Outfall 001A)	2.0	N/A
WQBELs	6.0	17.0
2007 TMDL WLA for DO	5.0 ^a	N/A
Selected Limits (Internal Outfall 001A)	6.0	17.0
Selected Limits (End of Pipe Outfall 001B)	2.0	N/A
<p>a. The TMDL established a WLA for DO that prohibited: “point source loading of oxygen-demanding substances that will cause a measurable decrease (0.2 mg/L) in DO level below 5.0 mg/L from June through September.” The impaired waters were those waters below the pycnocline.</p>		